

Working Knowledge at NASA

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Ask Questions, Find Help

Virtual PM CHALLENGE

NASA Virtual Project Management Challenge

Applications

- Twin Otter
- X-43A (Hyper-X)
- Sub-scale Transport Aircraft
- ARES I-X Launch Vehicle
- X-29A
- Tu-144LL Supersonic Transport
- 1903 Wright Flyer Replica
- Global Hawk

There are many others ...

16

00:10:54

00:15:42

Tour the Player (Virtual PM Challenge)

Info

Chapters

Virtual PM Challenge



Send Technical Issues to:
nasa-virtual-pm-challenge@mail.nasa.gov

Audience interaction



Links - link to related reference materials



Share presentation - email a presentation link bookmarked to play from a specific point



Polls



Ask a question



Where do you go to find
what you don't know?

The Library of Babel: A Parable



(c/o Library of Congress)

“There are official searchers....I have seen them in the performance of their function: they always arrive extremely tired from their journeys....Obviously no one expects to discover anything.”

“The certitude that some shelf...held precious books and that these precious books were inaccessible, seemed almost intolerable.”

Jorge Luis Borges, “The Library of Babel”

What do we mean by knowledge?

NASA requires many different kinds of knowledge, including:

Codified knowledge

- Scientific knowledge
- Engineering and technical knowledge
- Business processes

Know-how

- Techniques and craftsmanship
- Social knowledge (e.g., political savvy)

All are critical to mission success.

What do we mean by
knowledge management?

Knowledge management (KM) focuses on the policies, processes and practices that allow the Agency to identify and manage knowledge gained by our people in its varied forms. KM specifically addresses how knowledge is created, retained, shared, and transferred throughout NASA and with NASA's partners and contractors. It involves dynamic contextual learning that supports the effective transfer and utilization of knowledge throughout the Agency.

So What Has Changed?

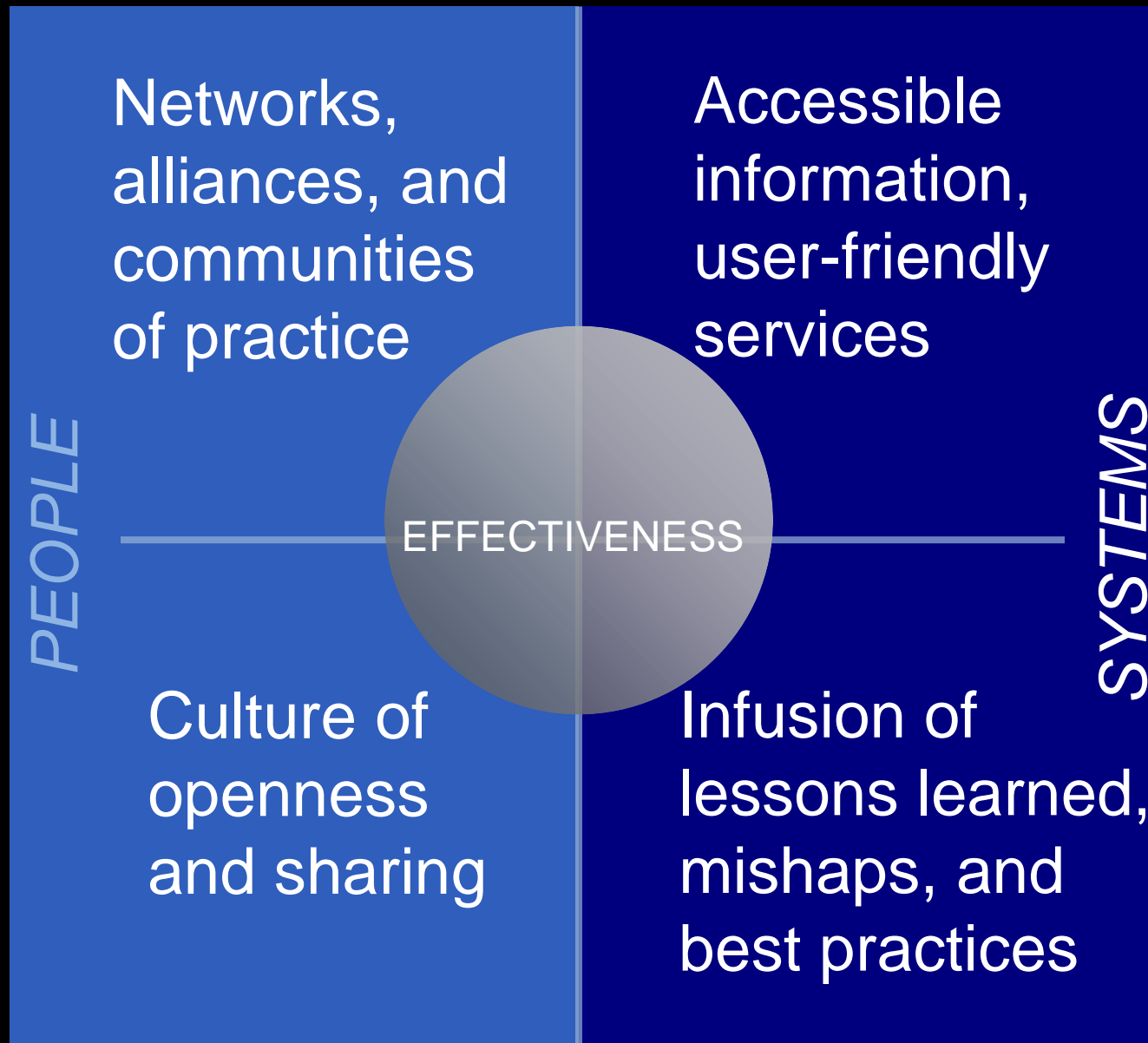
- Efforts to manage knowledge are nothing new at NASA.
- Many early attempts were **local** in response to specific needs, ranging from technical to organizational challenges.
- In recent years, NASA's stakeholders have identified **opportunities for greater coordination and collaboration** across the agency.

Why Does KM Matter?

Knowledge management is critical for:

- Sustaining and expanding the use of the Agency's intellectual capital across NASA's enterprises and generations
- Increasing collaboration across barriers
- Supporting our people in executing NASA's missions efficiently and effectively.

Knowledge Effectiveness = People + Systems



What Does the CKO Do?

CKOs outside NASA have tried to “manage” all the knowledge in their organizations...and failed.

Given the complex nature of knowledge at NASA, the agency has adopted a federated model for coordination and collaboration of knowledge activities.

The NASA CKO functions as a *facilitator* and *champion* for knowledge.

CKOs / POCs

Name	Center / Organization
Donald Mendoza	ARC
Bradford Neal	DFRC
Marton Forkosh	GRC
Edward Rogers	GSFC
David Oberhettinger	JPL
Jean Engle	JSC
Michael Bell	KSC
Manjula Ambur	LaRC
Dale Thomas	MSFC
John Stealey	SSC

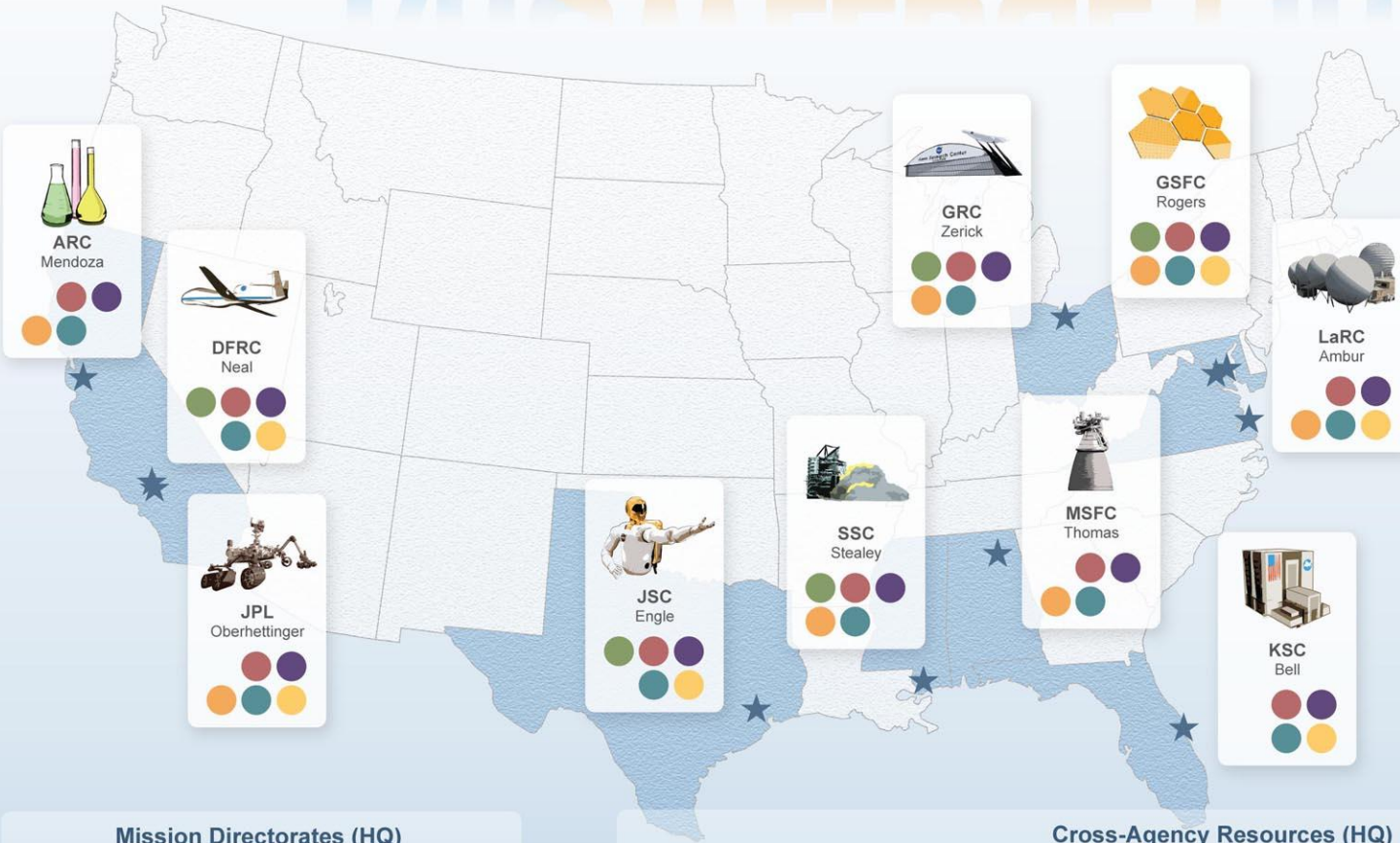
Name	Center / Organization
Susan Minor	ARMD
Dave Lengyel	HEOMD
George Albright	SMD
Don Moses	Acquisition
Ed Hoffman	Agency CKO
Daria Topousis	NEN
Lauren Leo	OHCM
Dan Yuchnovicz	NESC
Mike Lipka	NSC
Prasun Desai	STMD
Gerald Steeman	STI

To find knowledge,
it helps to have a map



National Aeronautics and Space Administration's

KNOWLEDGE MAP



Case Studies/
Publications



Face-to-Face
Knowledge Services



Online Tools



Knowledge
Networks



Lessons Learned/
Knowledge Processes



Search/Tag/
Taxonomy Tools

Mission Directorates (HQ)



ARMD
Minor



HEOMD
Lengyel



SMD
Albright



Cross-Agency Resources (HQ)



APPEL
Hoffman



NESG
Yuchnovicz



NEN
Topousis



NSC
Lipka



OHCM
Leo



OP
Moses



STI
Bierman



NASA Knowledge Map Link:

http://www.nasa.gov/externalflash/knowledge_map/

Knowledge Categories



**Case
Studies /
Publications**



**Face-to-Face
Knowledge
Services**



Online Tools



**Knowledge
Networks**



**Lessons
Learned /
Knowledge
Processes**



**Search / Tag
/ Taxonomy
Tools**

[Click for definitions.](#)

- **KM Online Tools:** Any online knowledge tools, including but not limited to: portals, document repositories, collaboration and sharing sites, video libraries.
- **Search/Tag/Taxonomy Tools:** Dedicated search engine for knowledge (e.g., Google Search Appliance); any initiatives related to meta-tagging or taxonomy.
- **Case Studies/Publications:** Original documents or multimedia case studies that capture project stories and associated lessons learned or best practices (e.g., GSFC case studies; APPEL case studies and *ASK Magazine* stories; NASA Safety Center case studies, etc.).
- **Lessons Learned/Knowledge Processes:** Any defined process that an organization uses to identify or capture knowledge, lessons learned, or best practices, including: Lessons Learned Information System vetting process, organization-specific lessons learned processes, benchmarking, knowledge sharing recognition programs, etc.).
- **Knowledge Networks:** Any defined knowledge network, such as a community of practice, expert locator, or mass collaboration activity.
- **Face-to-Face:** Any activities that bring people together in person to share knowledge and enhance relationships, trust, and open exchanges (e.g., forums, workshops, Lunch and Learn/Pause and Learn, etc.). Impact can be multiplied through online sharing.

Example #1: JPL Face-to-Face Knowledge Activities

Caltech Management Assoc (CMA) Leadership Forum (Public)

Formal mentoring program through Career Services (Center Only)

Heavy JPL participation at annual IEEE Aerospace Conference (technical papers and extensive networking) (Public)

Issue-specific Lunch & Learn (LaL) with Project System Engineers – under development

JPL Education & Public Outreach Program (Public)

JPL project-sponsored technical reviews and peer reviews

JPL Stories (Center Only)

Participation by JPLers on 59 standards developing organization (SDO) committees

Pause & Learn (PaL) with Project Managers – under development

Team X Concurrent Design Team (Center Only)

- Room with 10 concurrent work stations for Pre-Phase A activities

Example #2: JSC Online Tools and Search/Tag/Taxonomy

▼ Online Tools

JSC Knowledge Online (JKO) (NASA Only)

JSC Lessons Learned and JSC site within NASA LLIS (NASA Only)

Shuttle Knowledge Console (SKC) (NASA Only)

▼ Search / Tag / Taxonomy Tools

Application development for navigation, organization and search enhancement

Extensive taxonomy (structural & organizational) work for Shuttle Knowledge Console, Mission Operations Directorate
SharePoint migration and content storage management

JSC Semantic System including the taxonomy, ontology and term metadata library to enhance JSC Search (NASA Only)

Example #3: NESC Face-to-Face Knowledge Activities

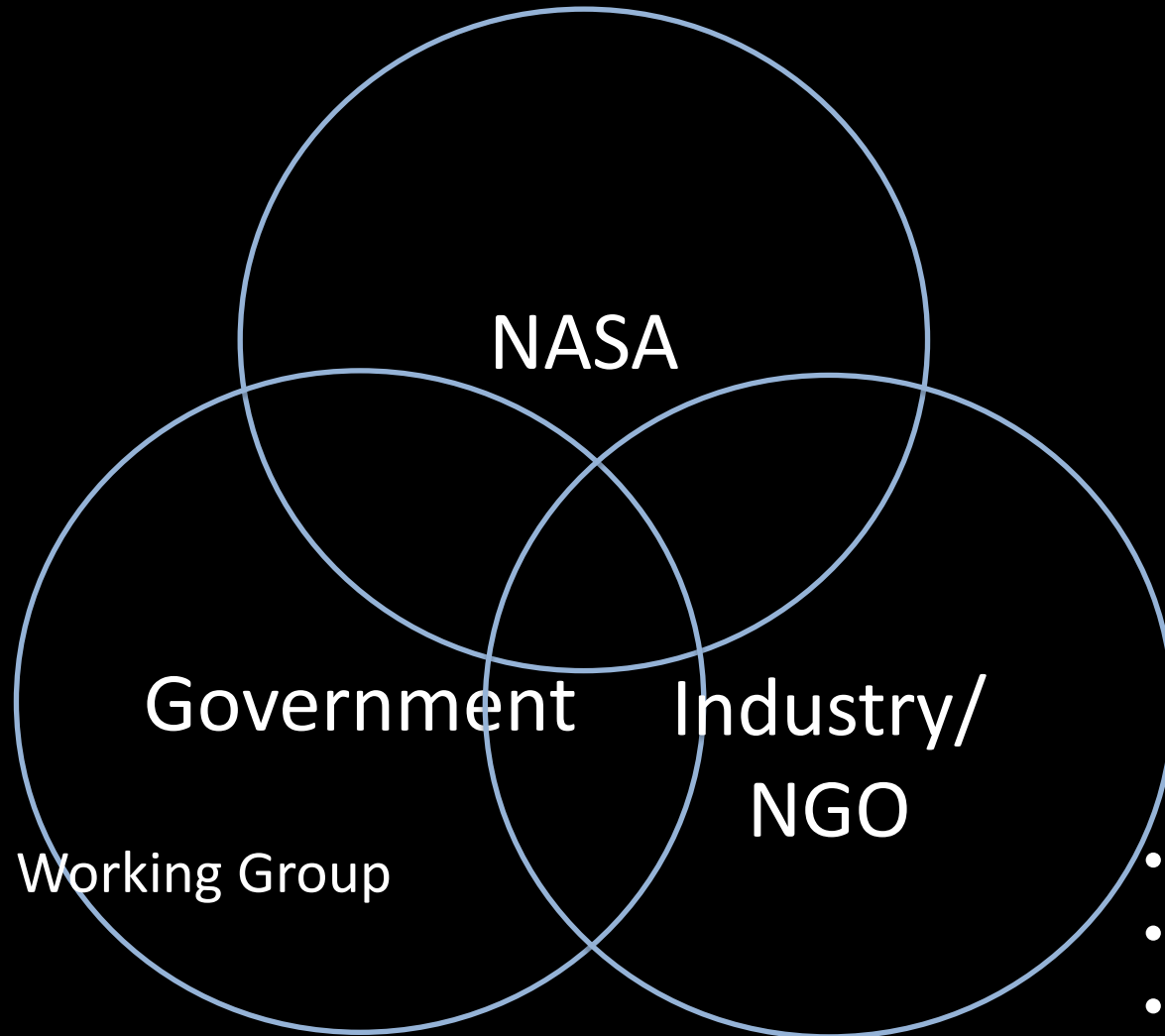
Examples of NESC-sponsored workshops:

- 2012 High Voltage Power Supply Design Workshop (Part I), April 2-3, 2012 (Public)
- 2012 High Voltage Power Supply Design Workshop (Part II), Oct. 22-23, 2012 (Public)
- Thermal & Fluids Analysis Workshop (TFAWS), August 13 -17, 2012
- Structures, Loads and Dynamics, and Mechanical Systems (SLaMS) Young Professionals Workshop, July 24 - 25, 2012
- 2012 NASA Spacecraft Fault Management Workshop, April 10 -12, 2012 (Public)
- In-Space Non-Destructive Inspection Technology Workshop, Feb 29 - Mar 1, 2012 (Public)
- Annual Data Mining and Trending workshops that brought together practitioners from across NASA, industry and academia.

NESC organization meetings include quarterly/semi-annual face-to-face meetings to discuss NESC process improvement, planning and knowledge sharing lectures from technical experts.

To find knowledge,
it's imperative to have a network

Knowledge Networks



- Federal KM Working Group
- CIA
- FBI

- APQC
- IPMC
- World Bank

Networks matter because
knowledge is social.

Bryan O'Connor, former Chief of the Office of Safety and Mission Assurance, on the importance of speaking up at NASA.

What does policy have to do with
knowledge effectiveness?

Knowledge Policy

- NASA's existing knowledge policy NPR 7120.6 is limited to a singular focus on lessons learned and the Lessons Learned Information System (LLIS) database.
- As the knowledge map illustrates, NASA has greatly expanded its knowledge activities to include a wide array of services.
- A new knowledge policy must reflect the breadth of knowledge approaches now in use across NASA.

What Will the Knowledge Policy Address?

1. Critical activities

- Codification and efficient flow of knowledge
- Environment that fosters continuous learning and adaptation
- Adoption of innovative global practices in knowledge
- Mitigation of knowledge loss
- Knowledge infusion

2. Approach to knowledge management

3. Roles and responsibilities

The approach represents *a way*, not *the way*.

Final Questions for Practitioners



Questions?

Upcoming Webcast

Date: June 6, 2013

Presenter: Ralph Roe, Director of the NASA
Engineering and Safety Center

Topic: 10 Years and Counting – The NASA Engineering
& Safety Center